

Orthopedic Terminologies

Dr. Samira Awad Satti

Assistant Professor

Orthopedic Surgeon

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Topics to be Covered

- Bone Structure → Anatomy & Histology
- Bone Types
- Terminology →
 - Descriptive
 - Structural
 - Radiological

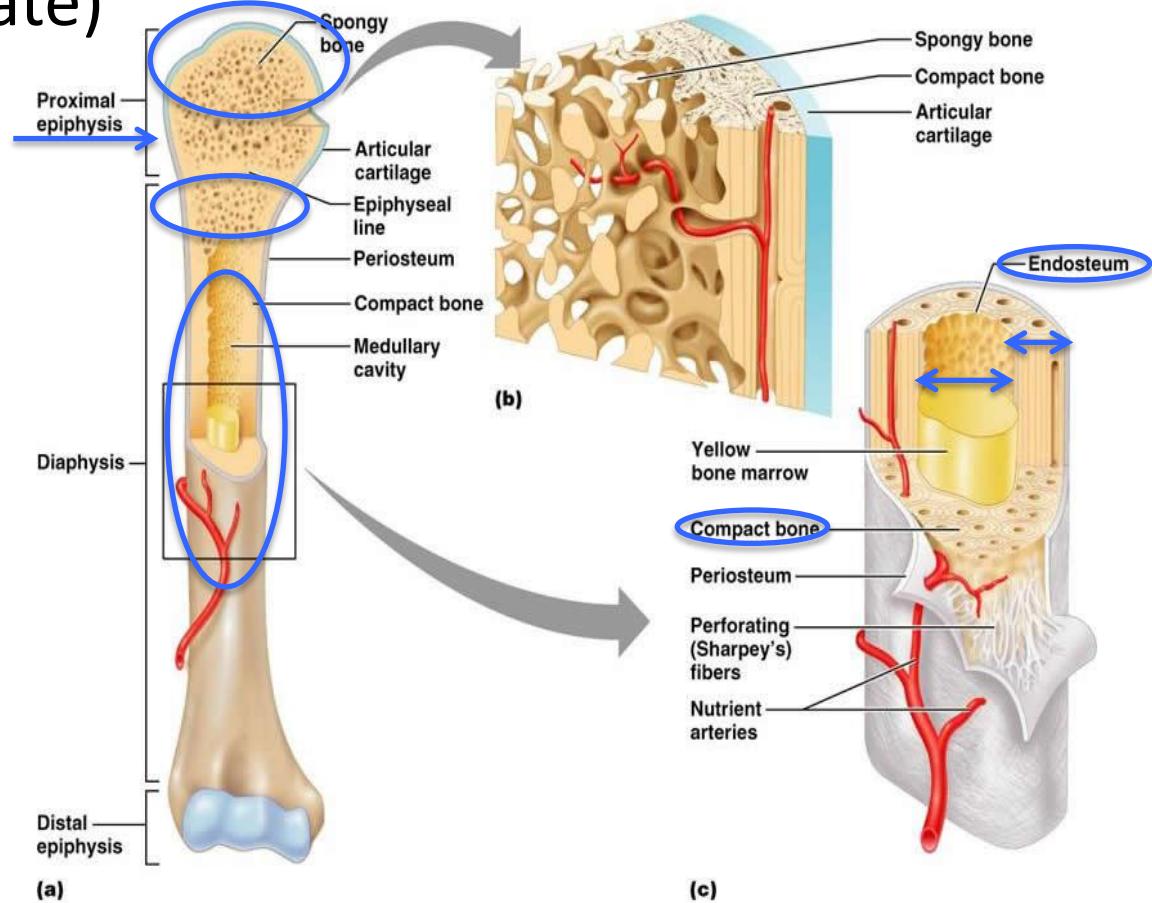
Bone Structures

Bone Anatomy

- **Epiphysis**
- **Physis (growth plate)**
- **Metaphysis**
- **Diaphysis**

- **Periosteum**
- **Endosteum**

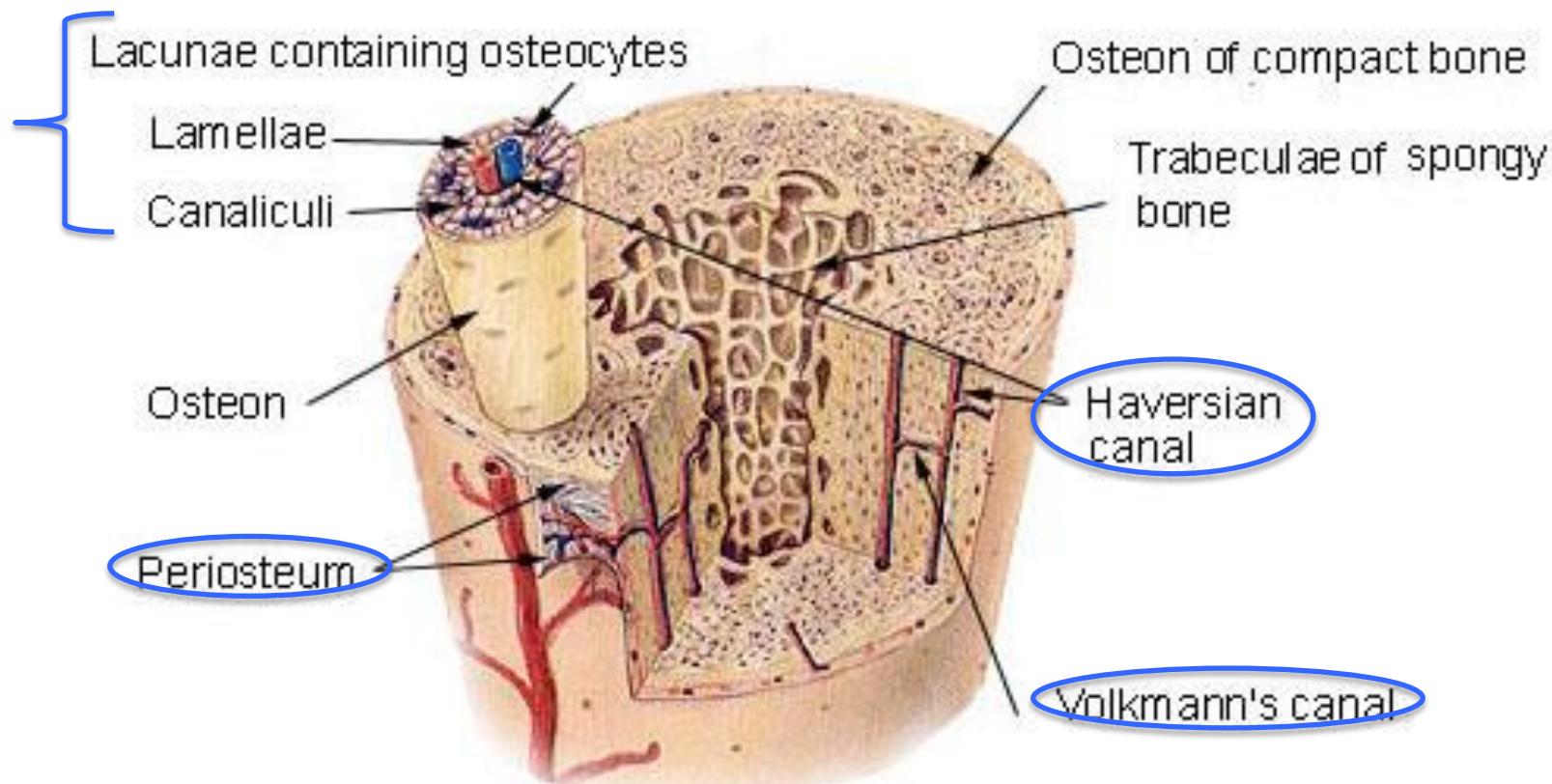
- **Cortex**
- **Bone marrow**



Bone Anatomy

Haversian canal

Compact Bone & Spongy (Cancellous Bone)

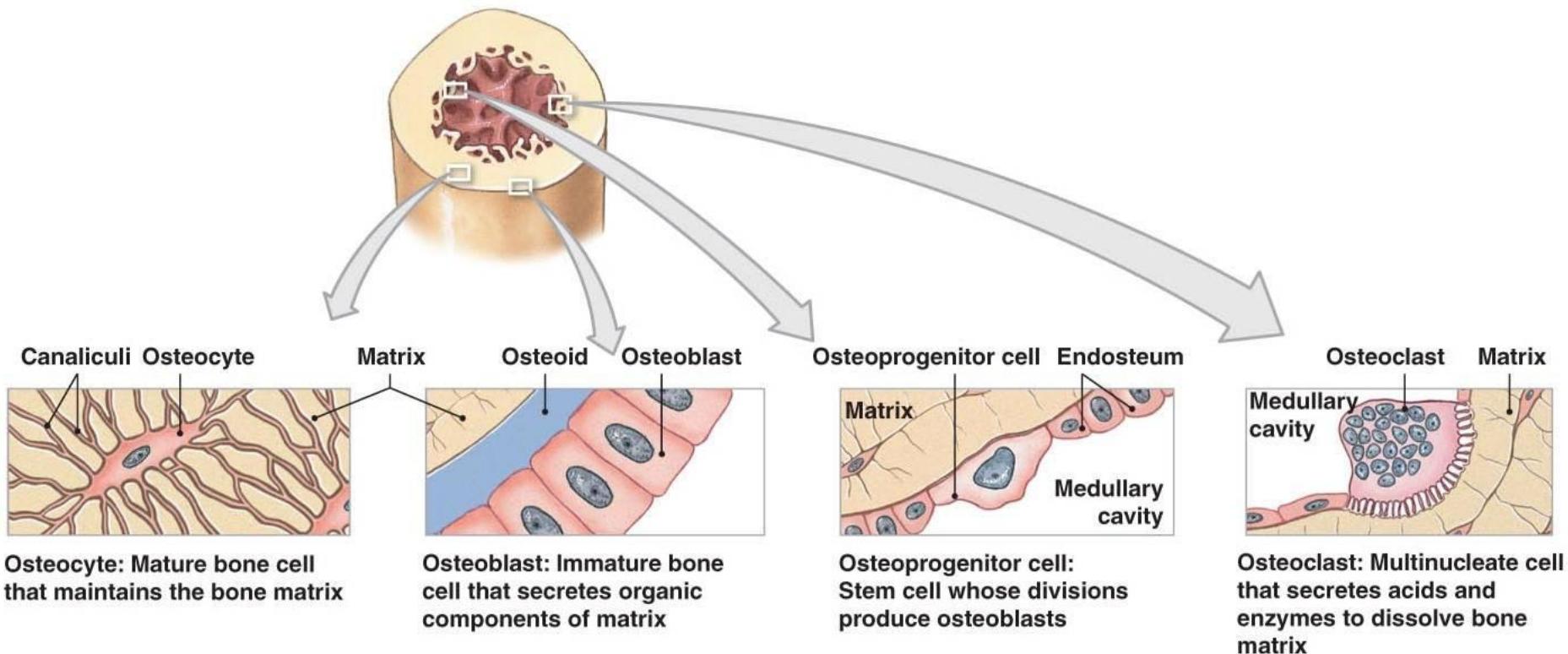


Bone Histology

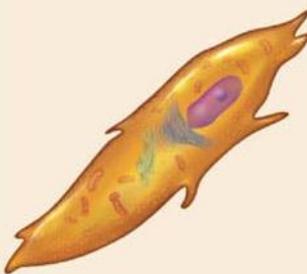
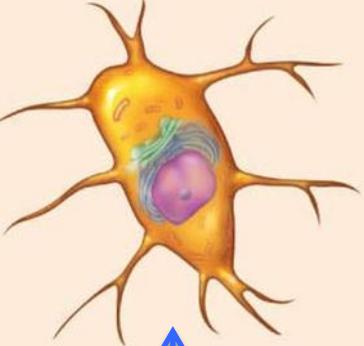
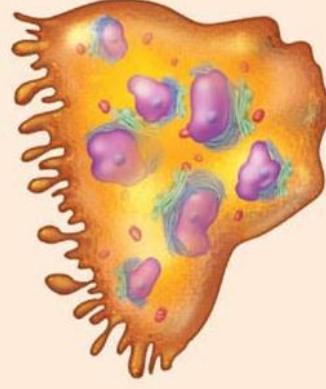
A) Cells:-

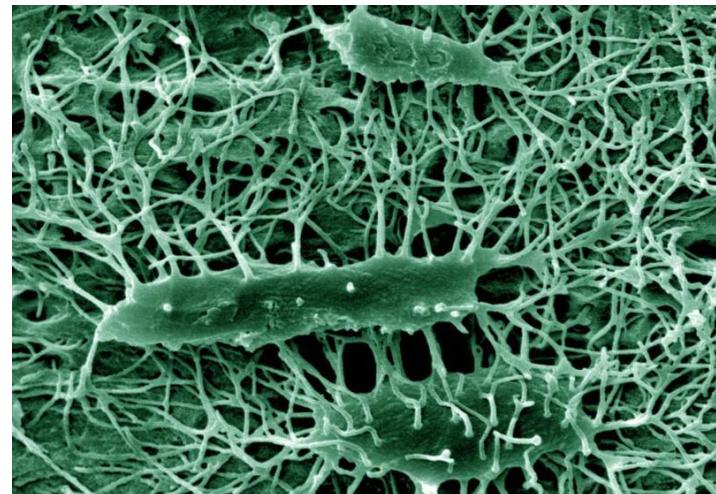
- **Osteo** →
 - Blast (premature)
 - Cyte (forming)
 - Clast (scavenger)
- **Chondro** → Cyte & Blast
- **Fibro** → Cyte & Blast

Bone Histology

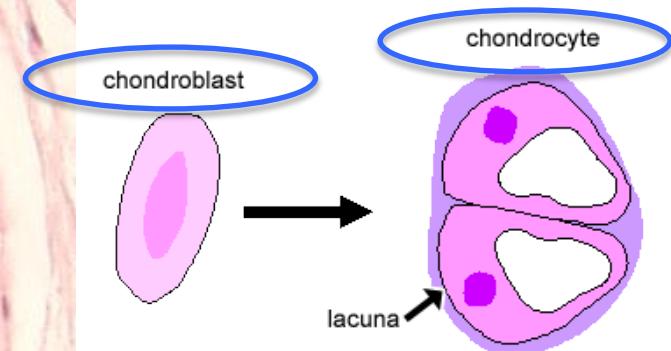
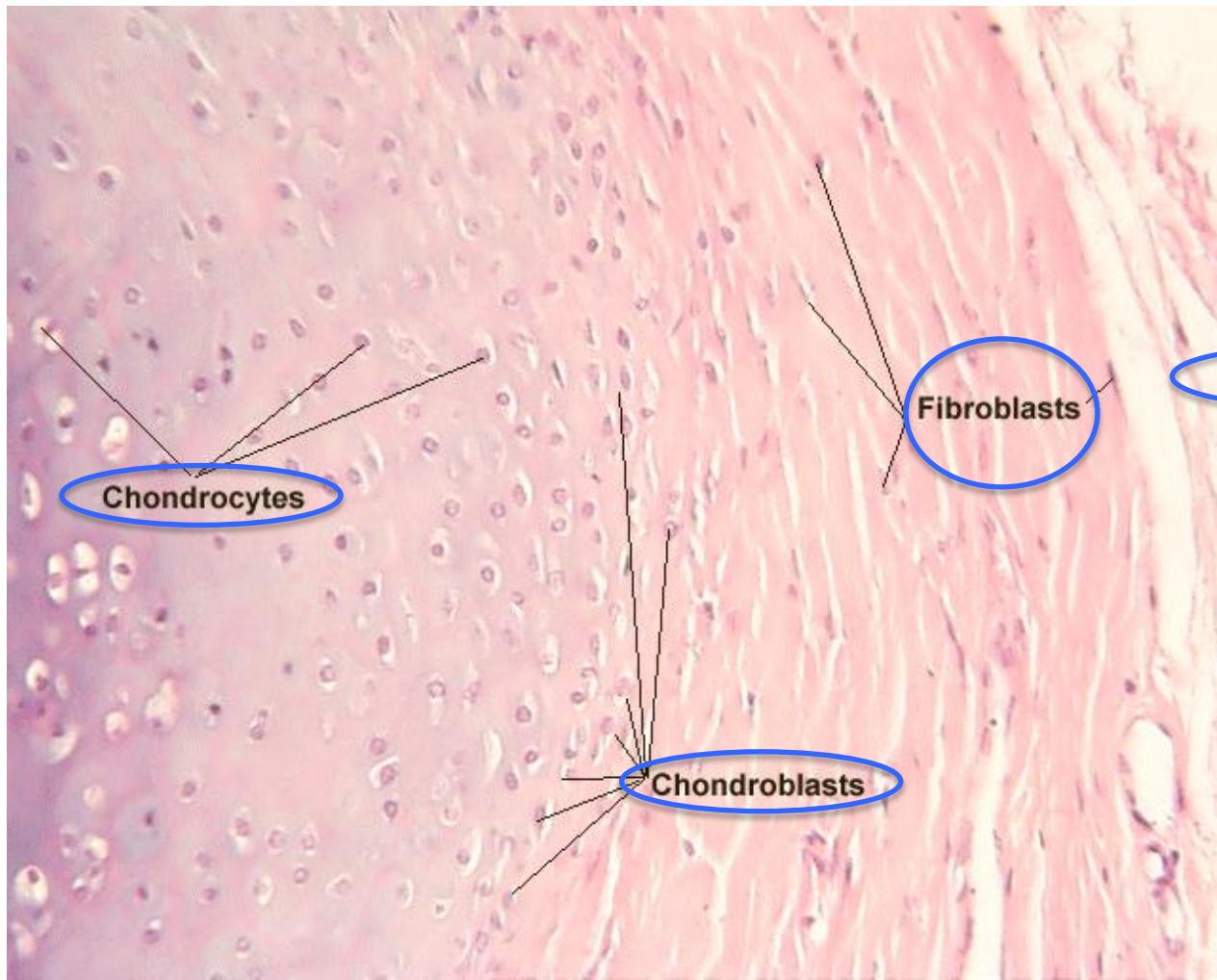


Bone Histology

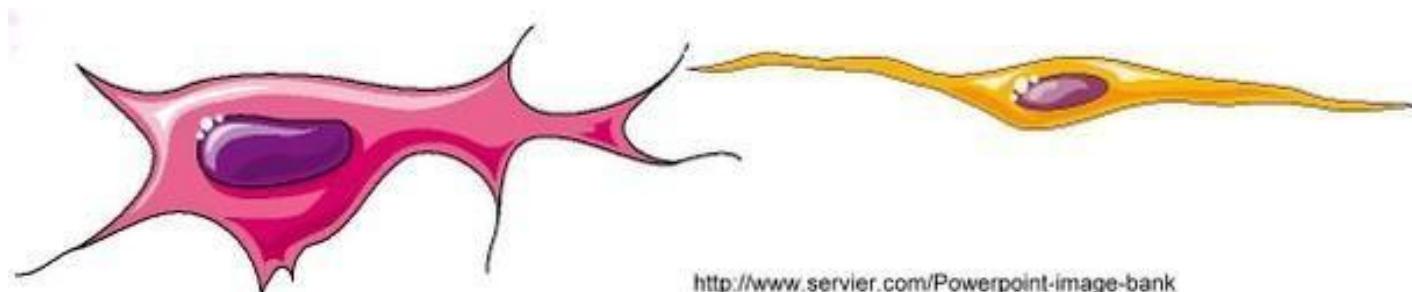
| (a) Osteogenic cell | (b) Osteoblast | (c) Osteocyte | (d) Osteoclast |
|---|--|---|---|
| Stem cell  | Matrix-synthesizing cell responsible for bone growth  | Mature bone cell that maintains the bone matrix  | Bone-resorbing cell  |



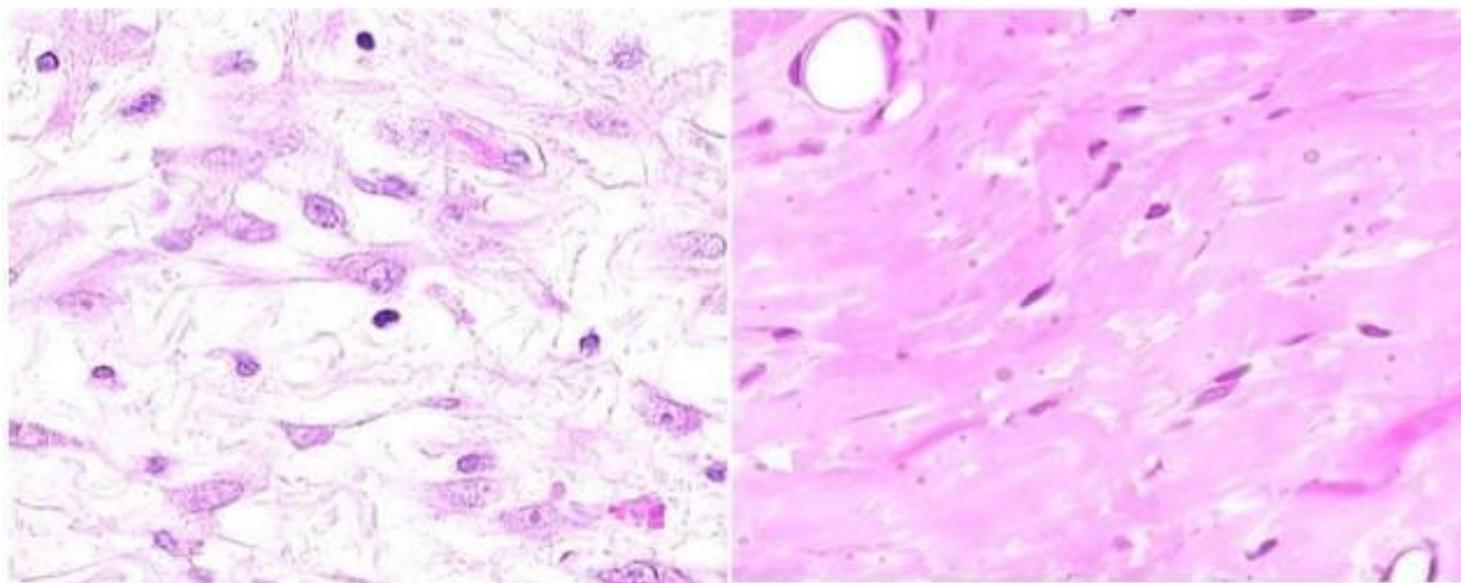
Bone Histology



Bone Histology



<http://www.servier.com/Powerpoint-image-bank>



Bone Histology

B) Matrix:-

– Organic →

- 40% of the dry weight
- Collagen II

– Minerals →

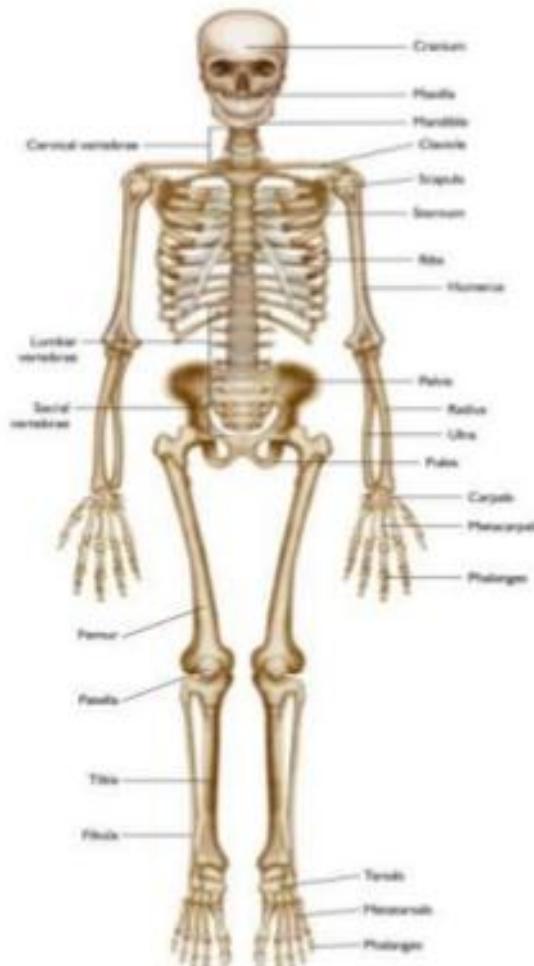
- 60%
- Calcium hydroxyapatite & Calcium phosphate

Bone Types

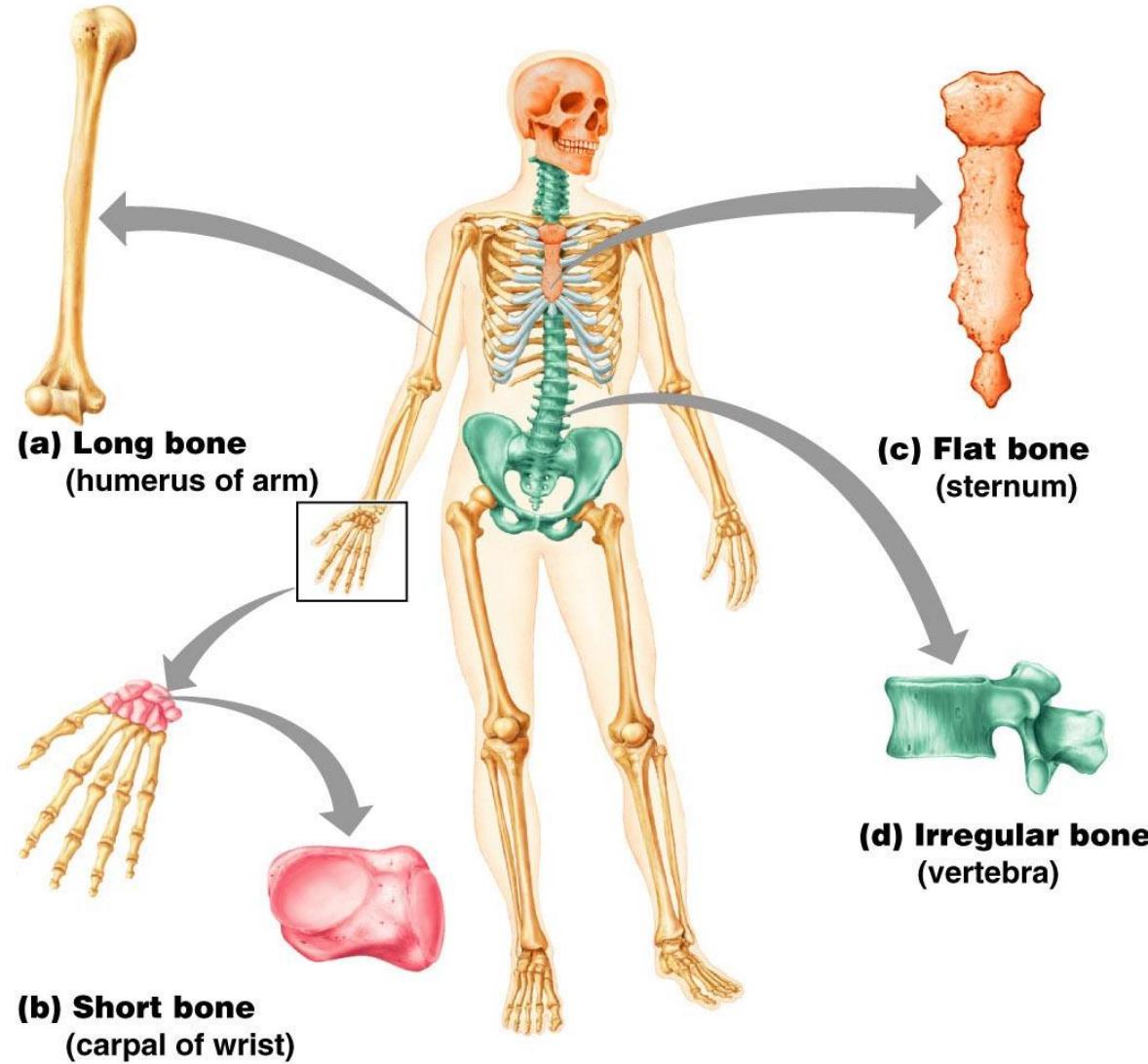
Bone Types

MORPHOLOGICAL CLASSIFICATION

- 1. Long bones
- 2. Short bones
- 3. Flat bones
- 4. Irregular bones
- 5. Pneumatic bones
- 6. Sesamoid bones
- 7. Accessory bones



Bone Types

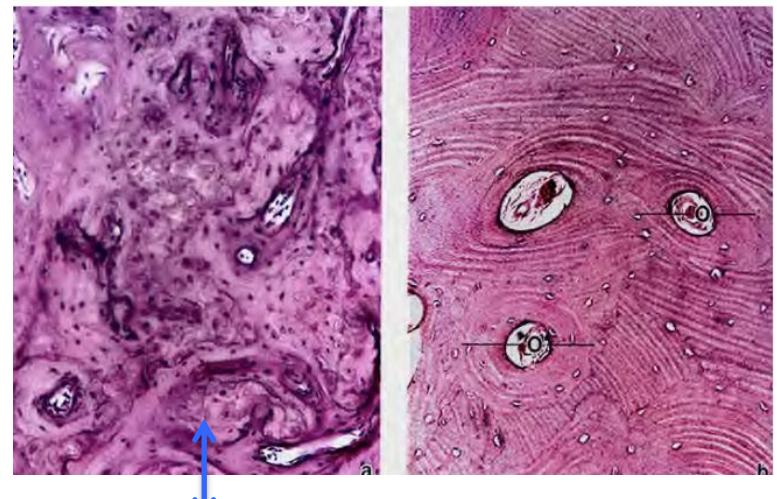


Bone Types

- **Lamellar** →
 - Cortical 80%
 - Cancellous 20%
- **Woven** →
 - Immature
 - Pathological

Immature and Mature Bone

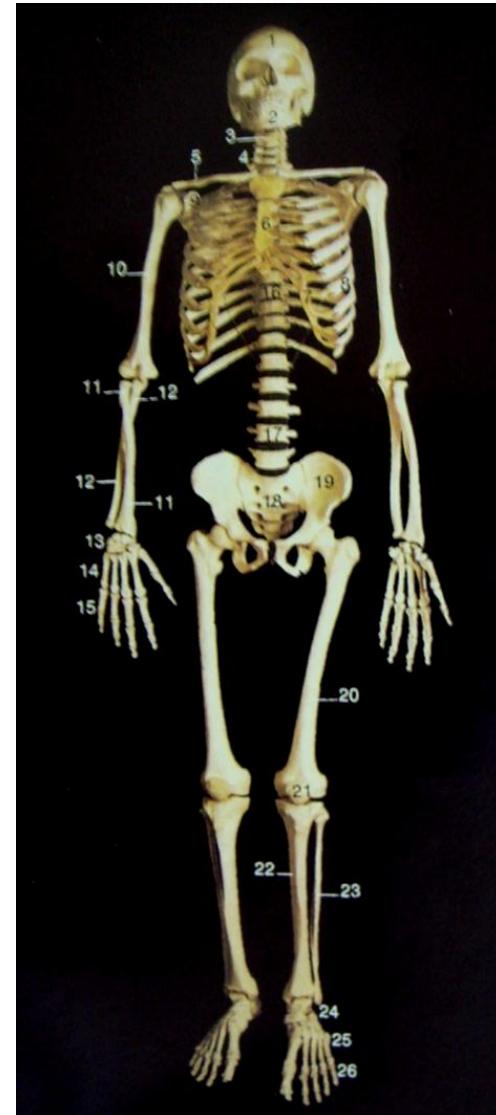
(nonlamellar, bundle, or woven bone)



Descriptive Terminology

Terminology

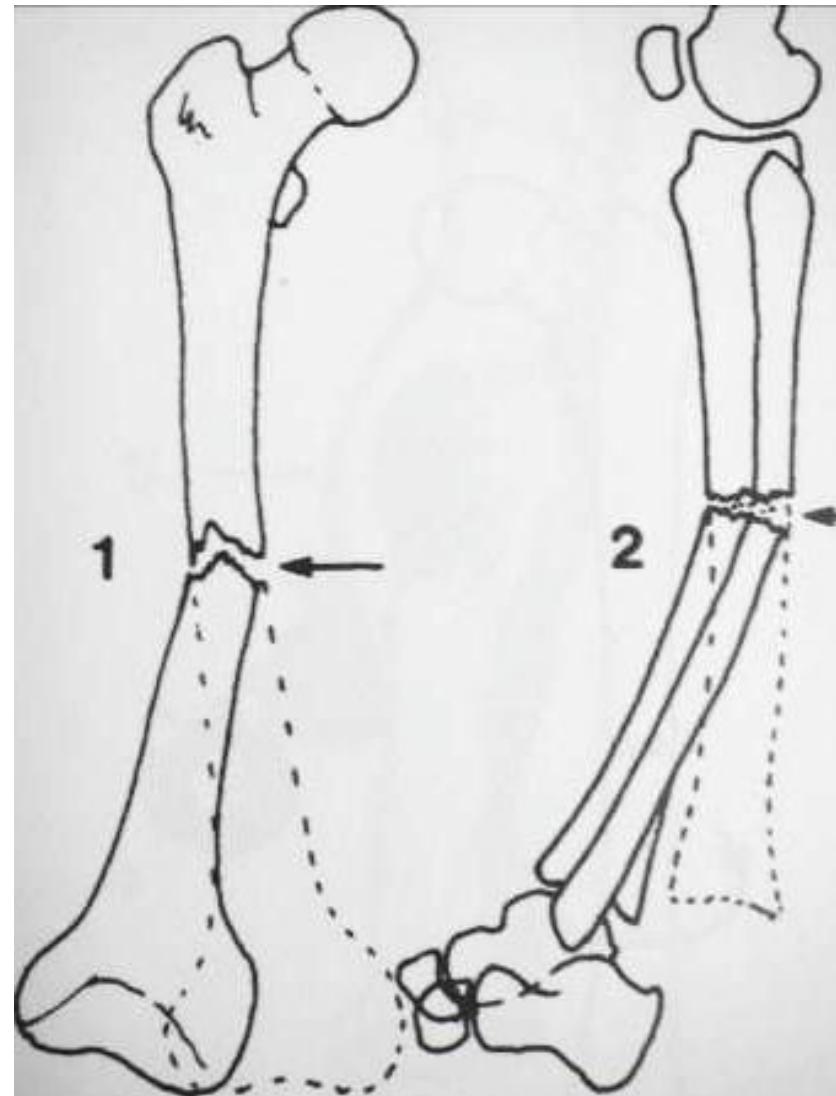
- Elbow → Cubitus
- Thumb → Policis
- Index → Indices
- Hip → Coxa
- Knee → Genu
- Foot → Pes / Pedis
- Big toe → Hallux



Terminology

When describing
→ a Deformity or
→ a Displaced #

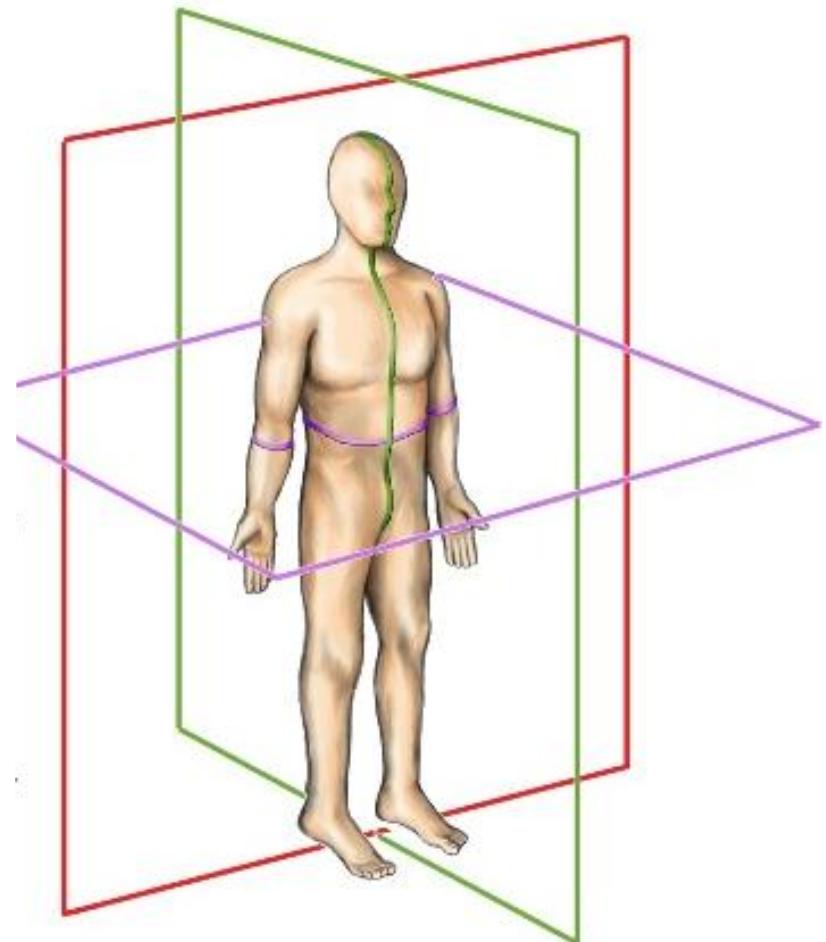
Always comment on
the *Distal* fragment



Terminology

Anatomical Planes

- **Coronal**
- **Sagittal**
- **Axial**



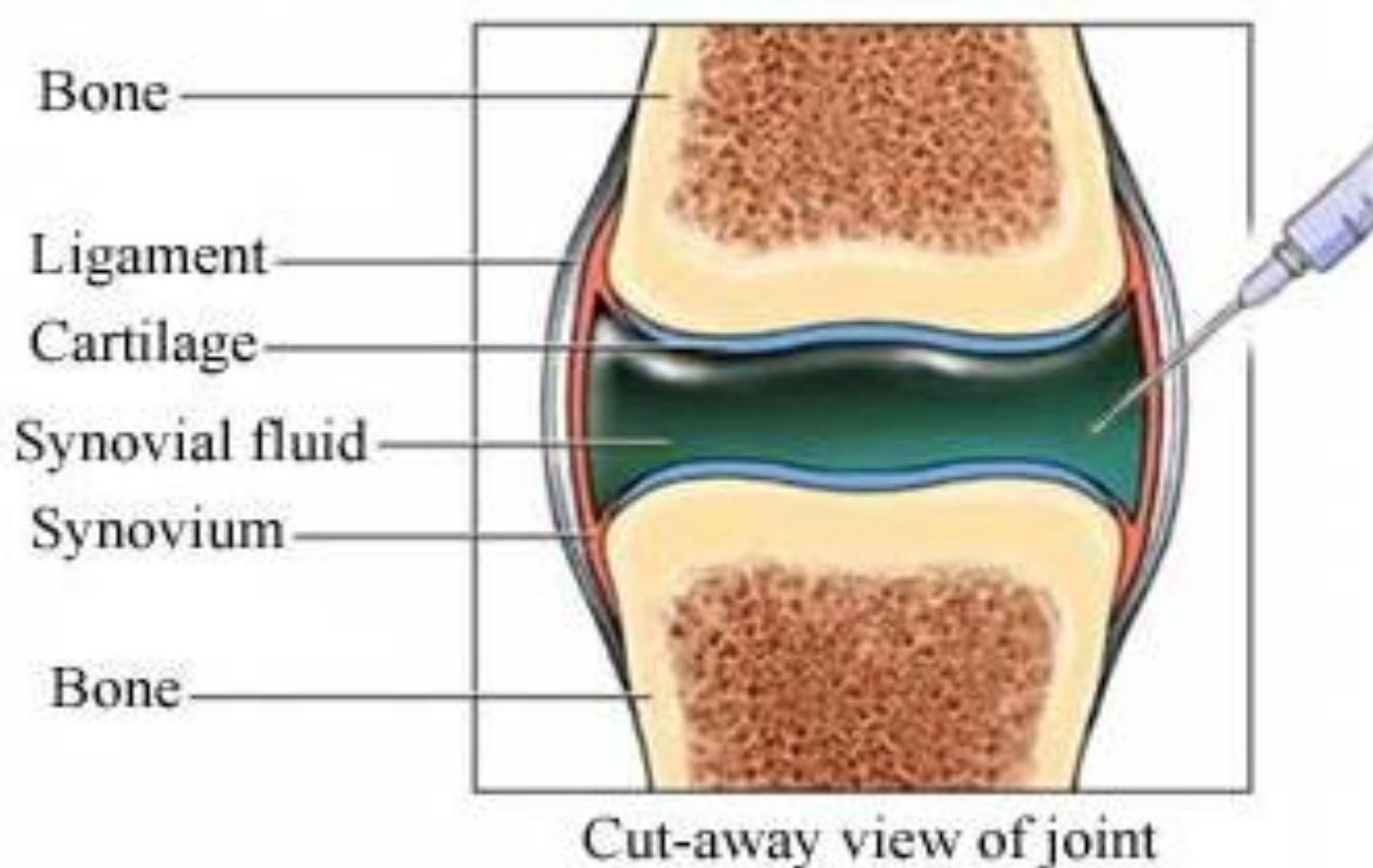
Terminology

Arthroscopy (Endoscopic examination of a joint)



Terminology

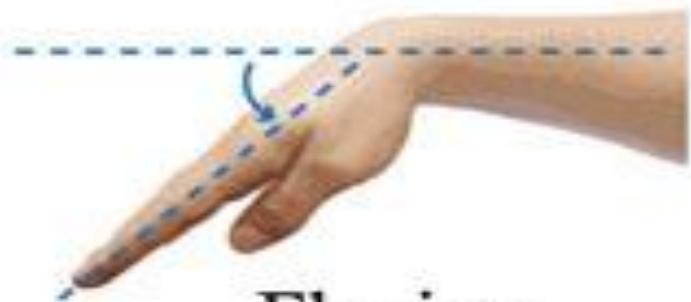
Arthrocentesis (Joint Aspiration)



Hand Terminology

| Name | Motion |
|-----------------------|---------------------------|
| • Palm = Volar aspect | • Flexion = Volar Flexion |
| • Dorsal | • Extension |
| • Ulnar side | • Ulnar deviation |
| • Radial side | • Radial deviation |
| | • Pronation / Supination |

Hand movements



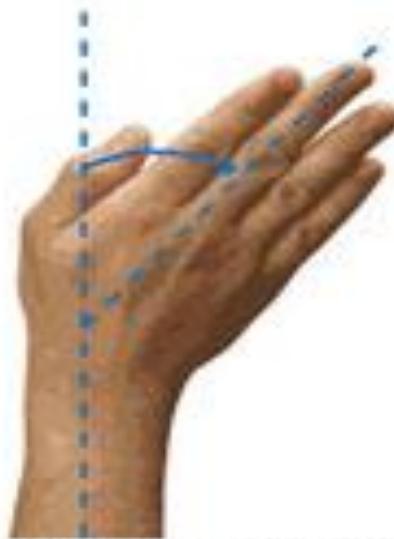
Flexion



Extension



Radial Deviation



Ulnar Deviation



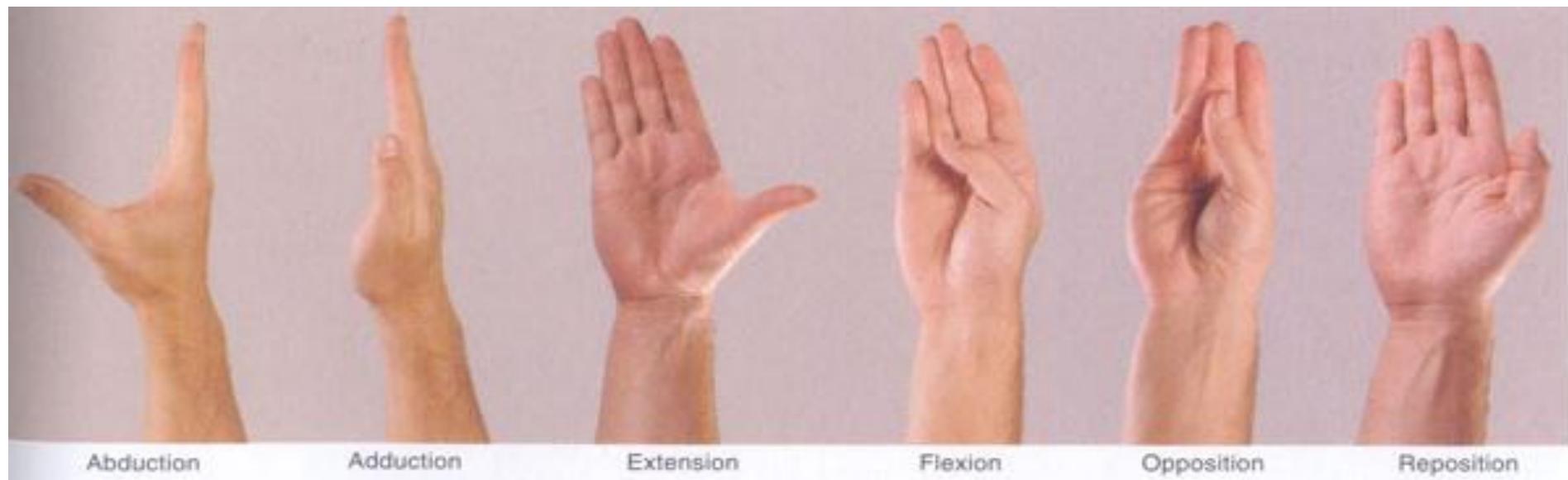
Pronation



Supination

Thumb Terminology

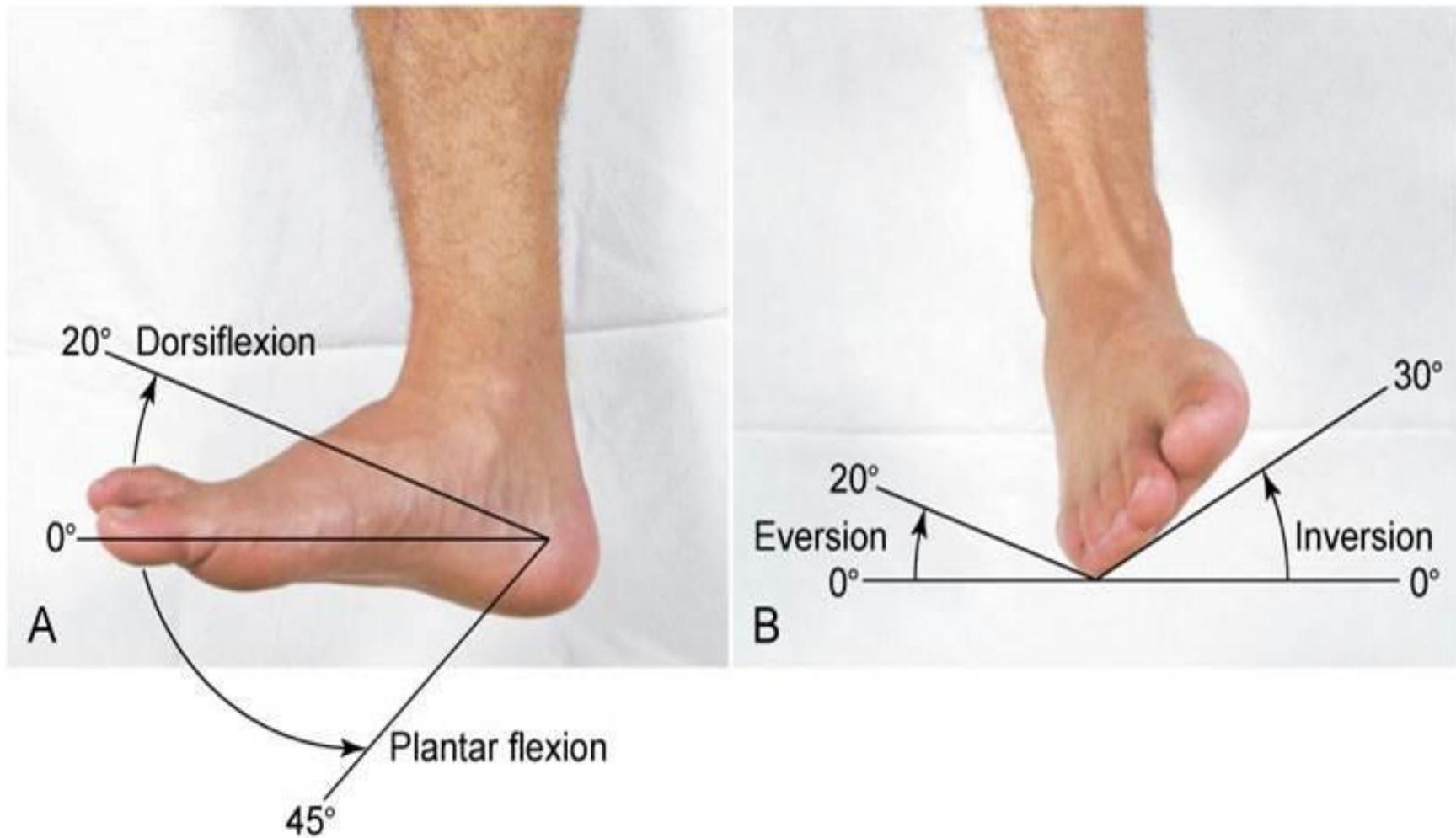
- Flexion / Extension
- Adduction / Abduction
- Opposition



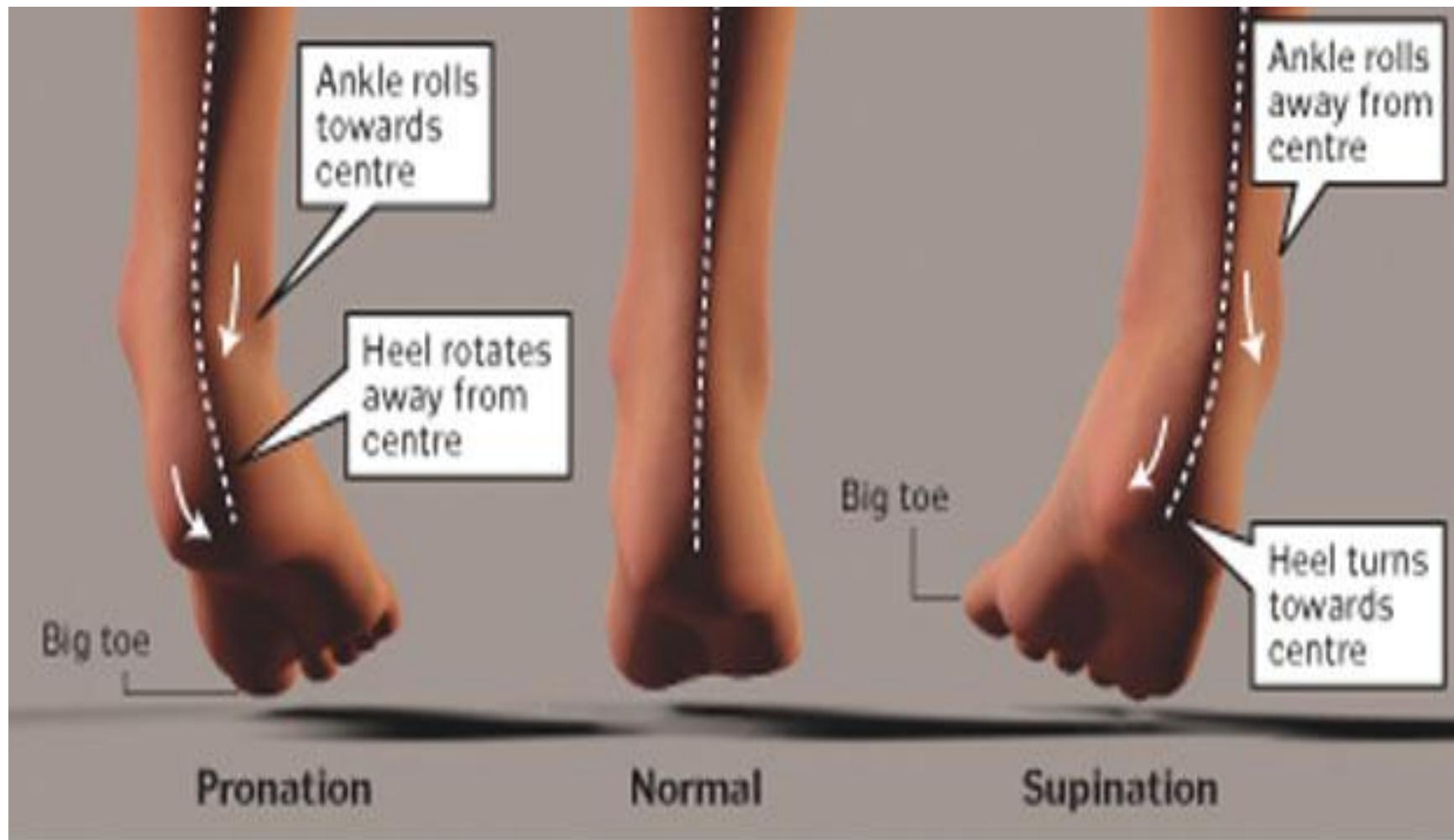
Foot Terminology

| Name | Motion |
|-------------------------|-----------------------------|
| • Sole = plantar aspect | • Plantar flexion |
| • Dorsal | • Dorsi-flexion (extension) |
| • Subtalar joint | • Varus / valgus |
| • Mid foot | • Supination / pronation |
| • Hind + mid foot | • Inversion / eversion |

Foot movements



Foot movements



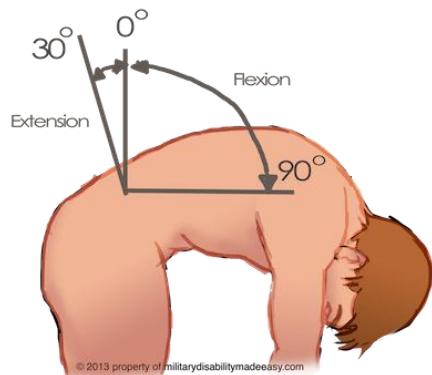
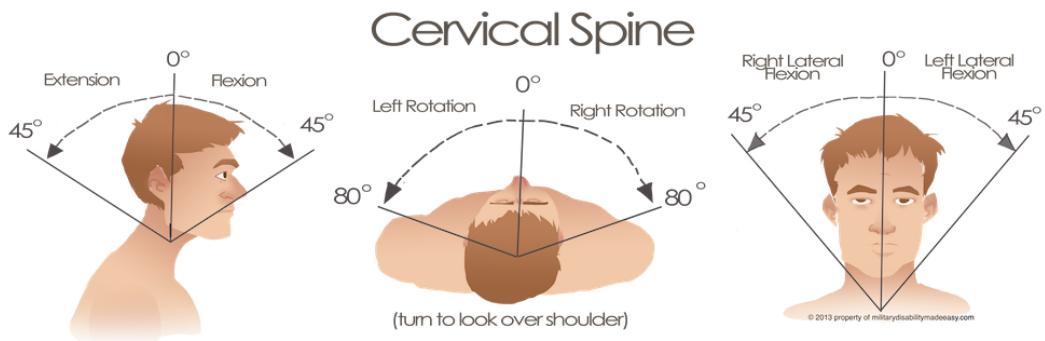
Foot Terminology

- Mid foot:
 - metatarsus adductus
 - Pes planus = flat foot
 - Pes cavus
- Hind foot:
 - Calcaneo valgus
 - Calcaneo varus

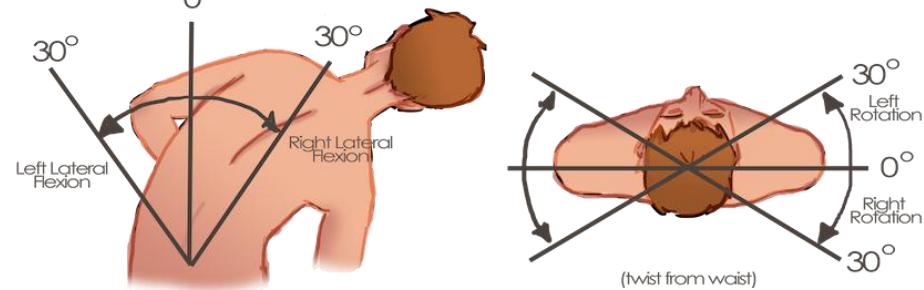


Spine Terminology

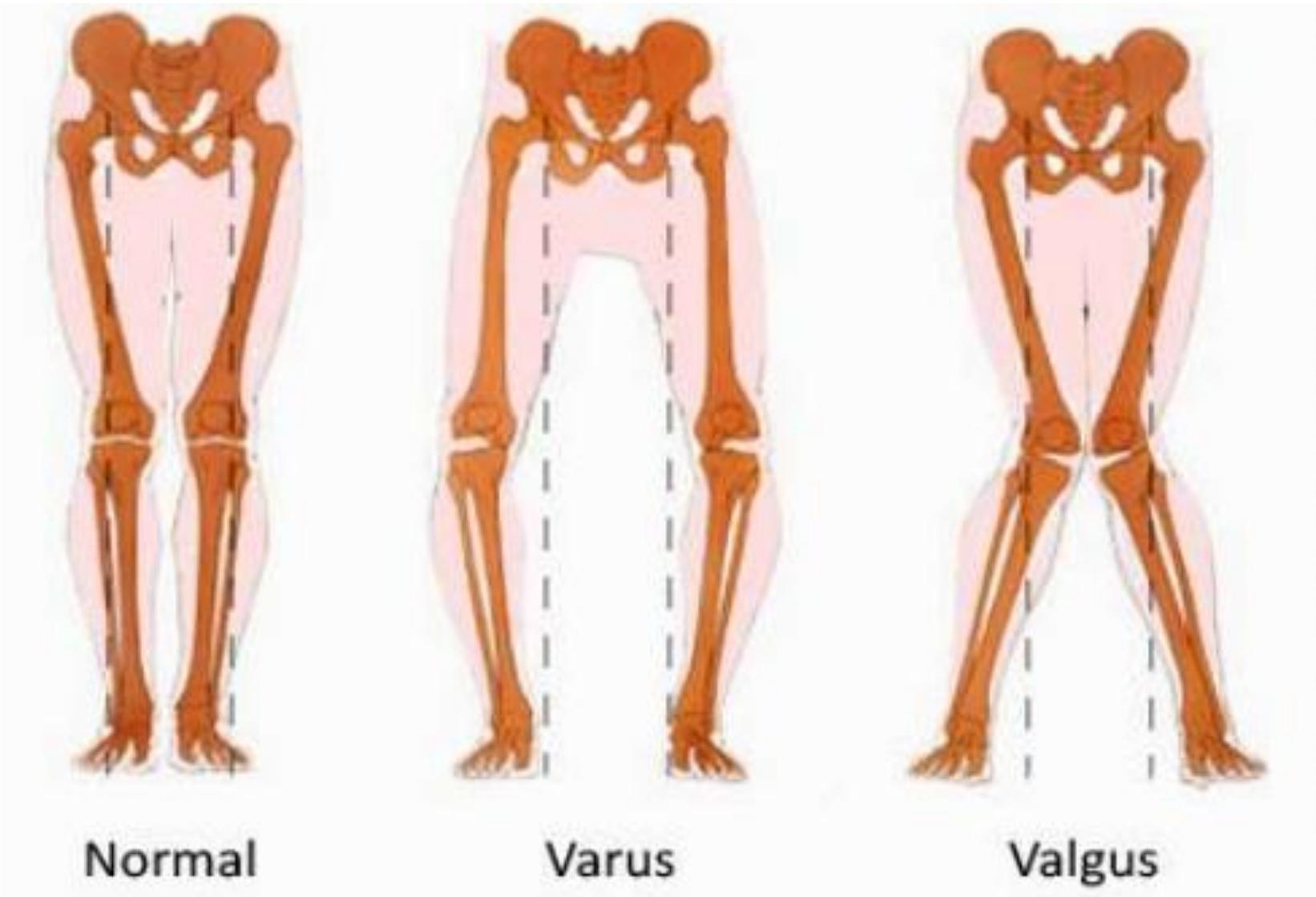
- Flexion
- Extension
- Bending → Rt /Lt
- Rotations → Rt /Lt



Thoracolumbar Spine



Alignment Terminology



Alignment Terminology

Recurvatum (hyperextension)

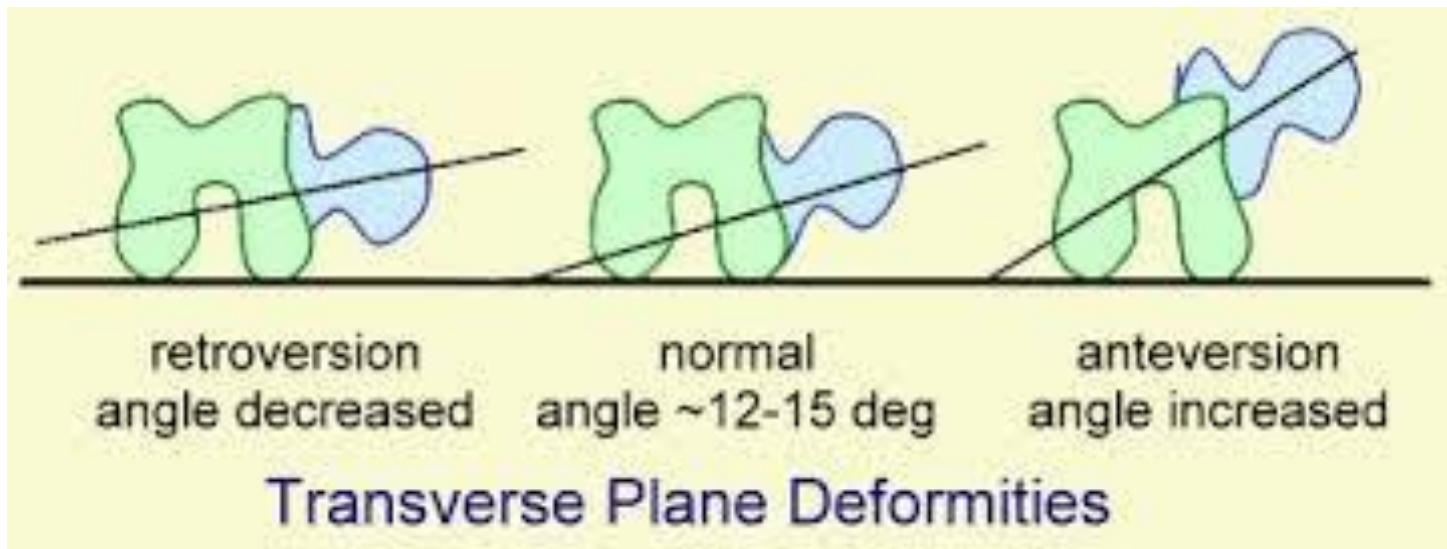
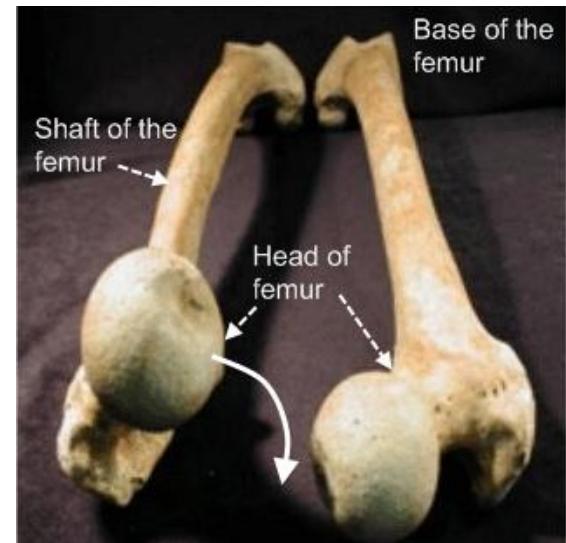


Procurvatum



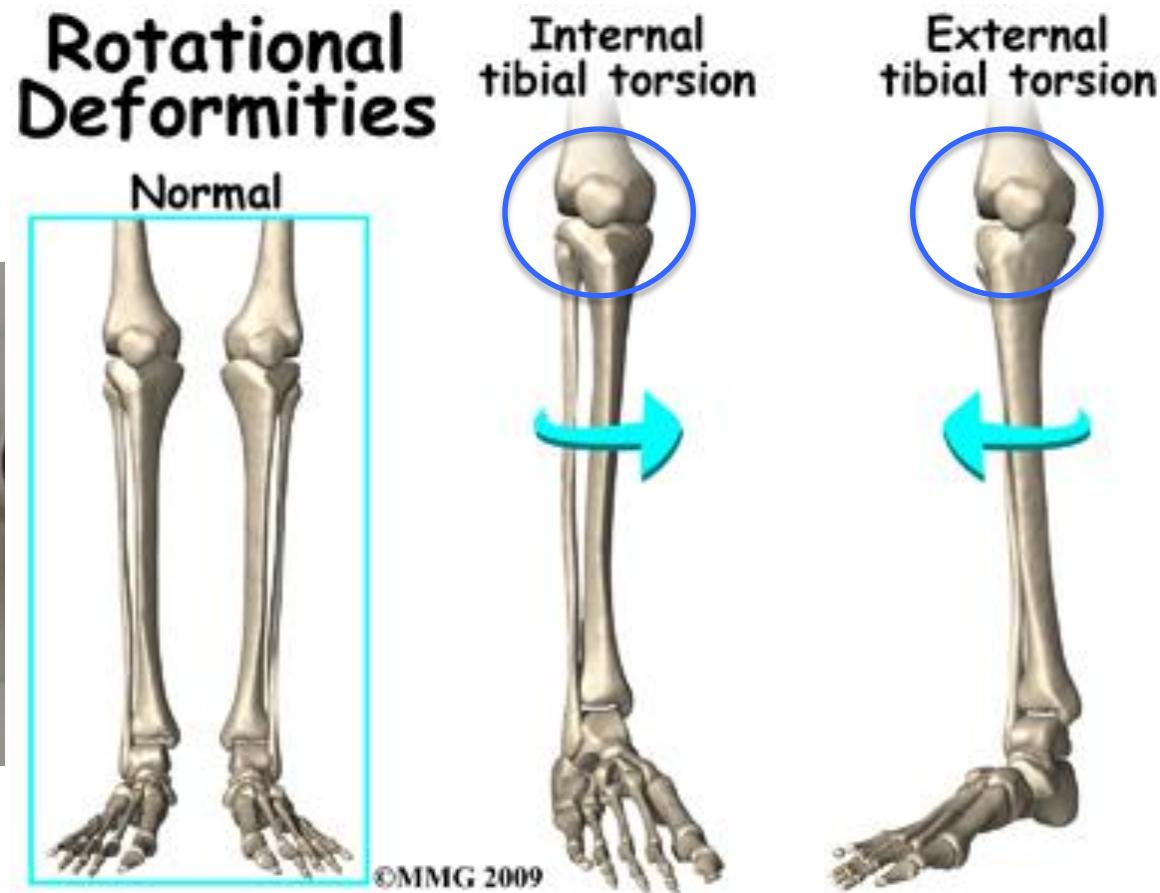
Rotation Terminology

- Version → increased normal angle
- Types:
 - Anteversion → anterior
 - Retroversion → posterior



Rotation Terminology

- Torsion → abnormal rotation
- Types:
 - Internal
 - external



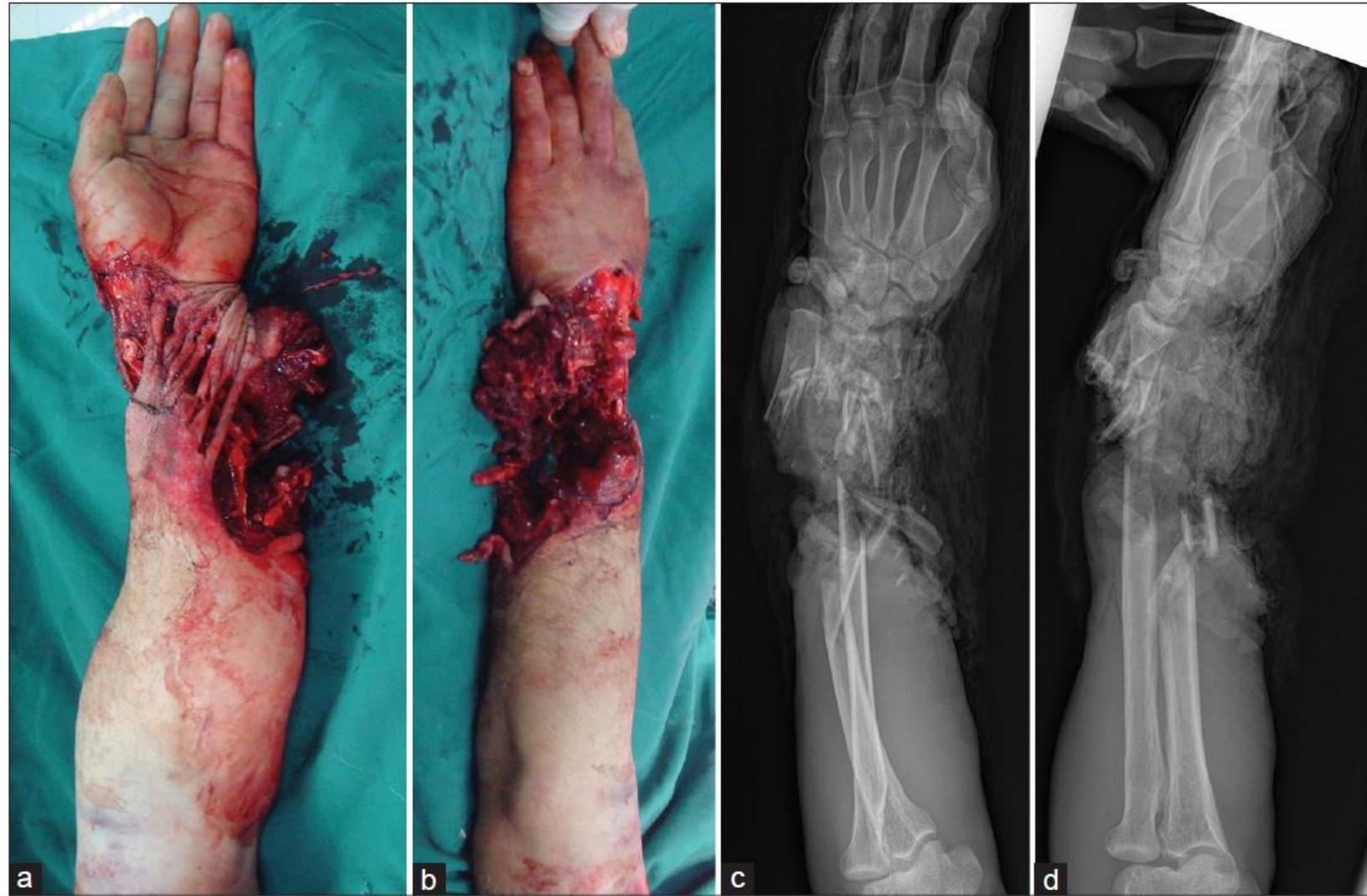
Structural Terminology

Bone

Fracture (#) is a **Break** in the structural continuity of bone

- **Open #** → # with a **wound** communicating with it
- **Closed #** → # with **intact skin**
- **Pathological #** → it's a # in a **diseased bone**
- **Crush injury** → it's high energy force from heavy object, with severe soft tissue & bone injuries

Crush Injury (U.L)



Crush Injury (L.L)

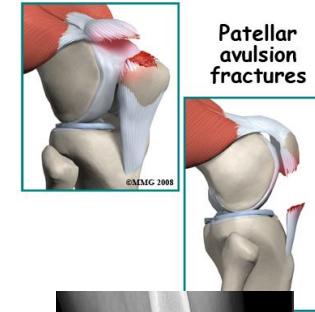


Bone

- **Complicated #** → # with injury to a major Blood vessel, nerve or nearby structures
- **Comminuted #** → Multi-fragmented #
- Complex # → *avoid to use*

Joints

- Dislocation → Complete loss of contact of articular surfaces
- Subluxation → Partial loss of contact of articular surfaces
- # Dislocation → Joint dislocation with a #
- Avulsion # → # of a bone tip at a tendon insertion



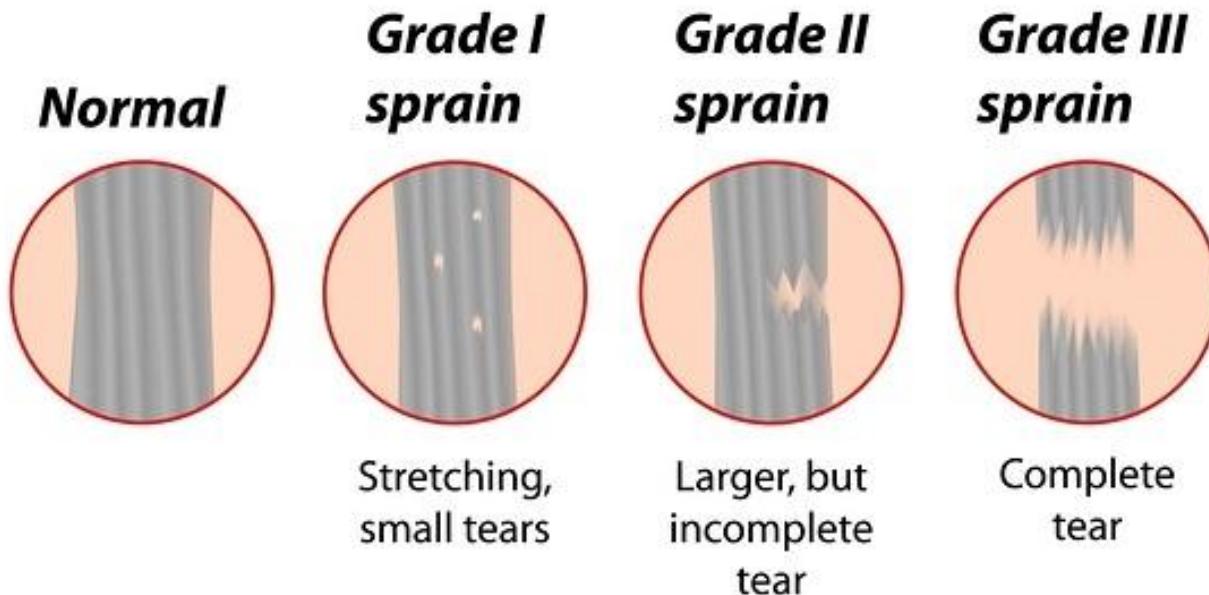
Joints

- **Stiffness** → Restricted motion in **one or more directions**
- **Fixed Deformity** → Loss of **all** Range of Motion
- **Bursitis** → Inflammation/infection of a bursa at bony prominence



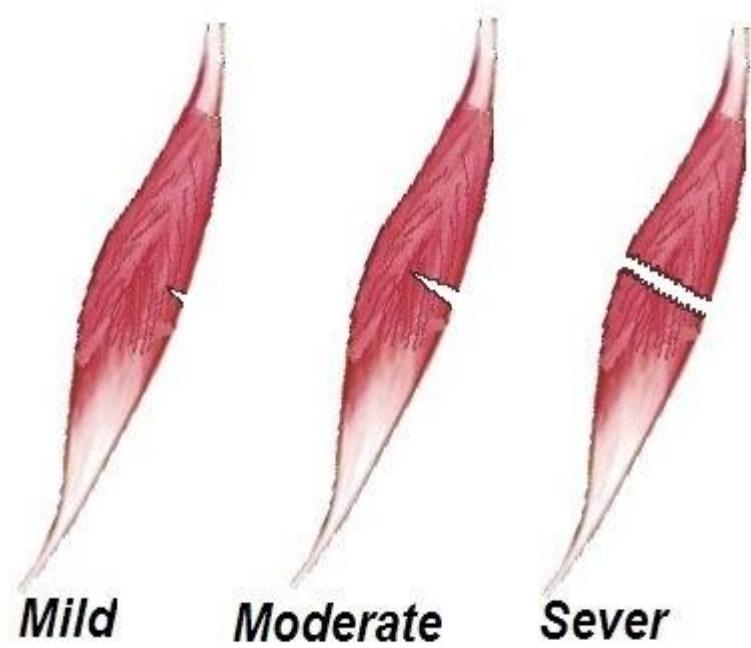
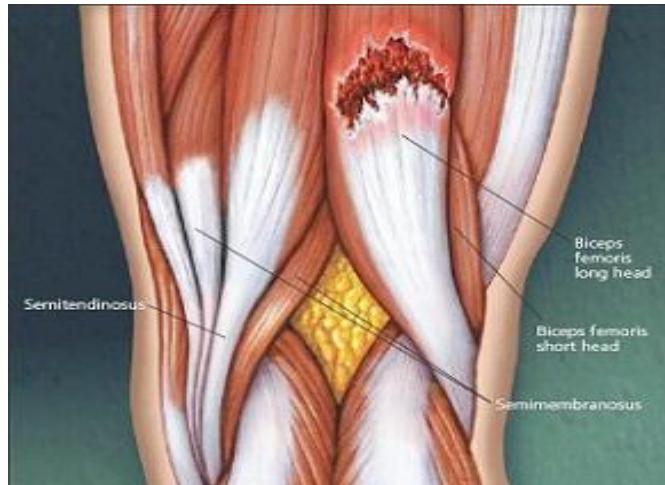
Ligaments / Tendons

- **Sprain** → Tear of some fibers only
- **Partial tear** → Incomplete tear
- **Complete tear**



Muscle

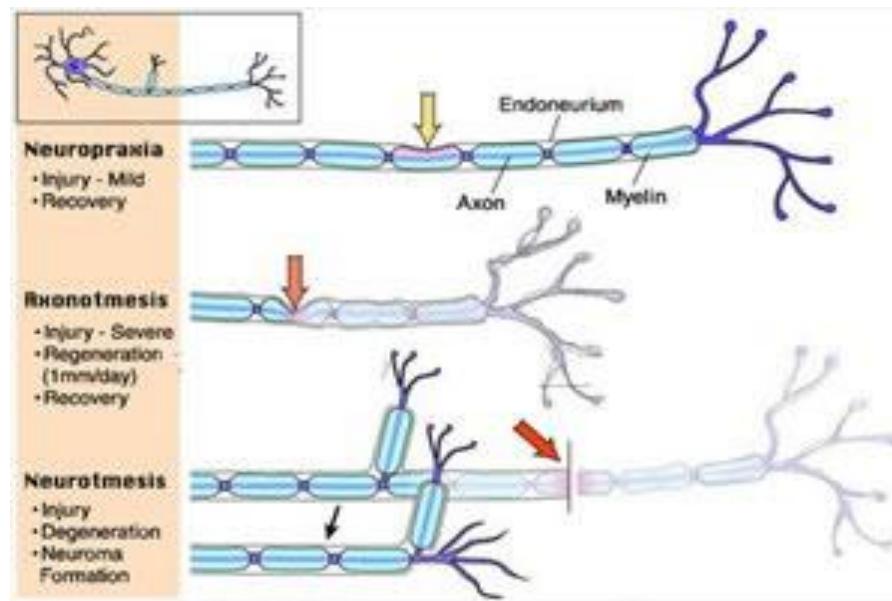
- **Contusion** → Small hematoma within muscle fibers
- **Strain** → Tear of some fibers only
- **Tear** (partial/complete) at →
 - Belly
 - Musculo-tendinous junction



Nerves

- **Neurapraxia** → Reversible nerve **conduction block** due to segmental demyelination
- **Axonotmesis** → Cut of the nerve axon with an intact myelin sheath
- **Neurotmesis** → Complete nerve cut

Nerves

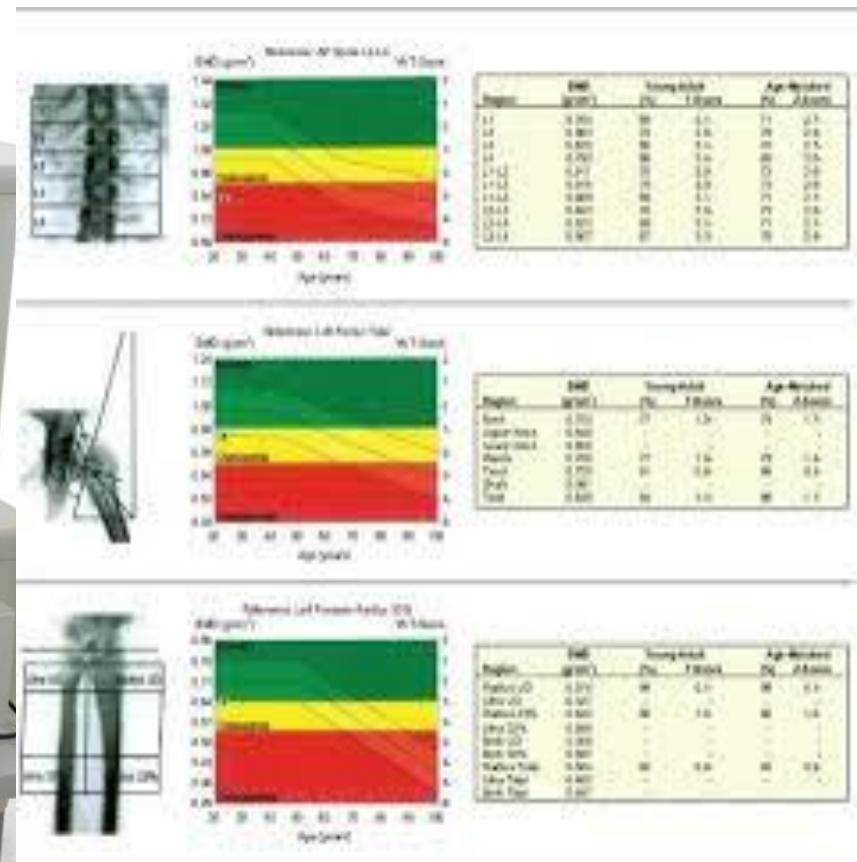


Radio logical Terminologies

Radiological Terminologies

- X-ray (Plain & Contrast)
- CT
- MRI
- Bone scans (Isotopes)
- DEXA → Dual Emission XR Absorptiometry
- Arthrogram → Contrast in a joint

DEXA Scan



Arthrogram



Any Questions ?

Remember

- Bone Structure → Anatomy & Histology
- Bone Types → Long; Short; Flat; Irregular; Lamellar; Woven
- Descriptive → Latin terminology; Alignment; Rotation
- Structural disorders → Bone; Joints; Ligaments; Muscles; Nerves
- Radiological → DEXA; Arthrogram; MRI; CT; Isotope scan